

The PREFACE.

Whether also those steams, which seem to issue out of the Earth, and mix with the Air (and so to precipitate some aqueous Exhalations, where-with 'tis impregnated) may not be by some way detected before they produce the effect, seems hard to determine; yet something of this kind I am able to discover, by an Instrument I contriv'd to shew all the minute variations in the pressure of the Air; by which I constantly find, that before, and during the time of rainy weather, the pressure of the Air is less, and in dry weather, but especially when an Eastern Wind (which having past over vast tracts of Land is heavy with Earthy Particles) blows, it is much more, though these changes are varied according to very odd Laws.

The Instrument is this. I prepare a pretty capacious Bolt-head A B, with a small stem about two foot and a half long D C; upon the end of this D I put on a small bended Glas, or brazen Syphon D E F (open at D, E and F, but to be closed with cement at F and E, as occasion serves) whose stem F should be about six or eight inches long, but the bore of it not above half an inch diameter, and very even; these I fix very strongly together by the help of very hard Cement, and then fit the whole Glas A B C D E F into a long Board, or Frame, in such manner, that almost half the head A B may lye buried in a concave Hemisphere cut into the Board R S; then I place it so on the Board R S, as is exprest in the first Figure of the first Scheme; and fix it very firm and steady in that posture, so as that the weight of the Mercury that is afterwards to be put into it, may not in the least shake or stir it; then drawing a line X Y on the Frame R T, so that it may divide the ball into two equal parts, or that it may pass, as 'twere, through the center of the ball. I begin from that, and divide all the rest of the Board towards U T into inches, and the inches between the 25 and the end E (which need not be above two or three and thirty inches distant from the line X Y) I subdivide into Decimals; then stopping the end F with soft Cement, or soft Wax, I invert the Frame, placing the head downwards, and the Orifice E upwards; and by it, with a small Funnel, I fill the whole Glas with Quicksilver; then by stopping the small Orifice E with my finger, I oftentimes erect and invert the whole Glas and Frame, and thereby free the Quicksilver and Glas from all the bubbles or parcels of lurking Air; then inverting it as before, I fill it top full with clear and well strain'd Quicksilver, and having made ready a small ball of pretty hard Cement, by heat made very soft, I press it into the hole E, and thereby stop it very fast; and to secure this Cement from flying out afterward, I bind over it a piece of Leather, that is spread over in the inside with Cement, and wound about it whilst the Cement is hot: Having thus fastned it, I gently erect again the Glas after this manner: I first let the Frame down edge-ways, till the edge R V touch the Floor, or ly horizontal; and then in that edging posture raise the end R S; this I do, that if there chance to be any Air hidden in the small Pipe E, it may ascend into the Pipe F, and not into the Pipe D C: Having thus erected it, and hung it by the hole Q, or fixt it perpendicularly by any other means, I open the end F, and

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and by a small Syphon I draw out the Mercury so long, till I find the surface of it A B in the head to touch exactly the line X Y; at which time I immediately take away the Syphon, and if by chance it be run somewhat below the line X Y, by pouring in gently a little Mercury at F, I raise it again to its desired height, by this contrivance I make all the sensible rising and falling of the Mercury to be visible in the surface of the Mercury in the Pipe F, and scarce any in the head A B. But because there really is some small change of the upper surface also, I find by several Observations how much it rises in the Ball, and falls in the Pipe F, to make the distance between the two surfaces an inch greater then it was before; and the measure that it falls in the Pipe is the length of the inch by which I am to mark the parts of the Tube F, or the Board on which it lyes, into inches and Decimals: Having thus justned and divided it, I have a large Wheel M N O P, whose outmost limb is divided into two hundred equal parts; this by certain small Pillars is fixt on the Frame R T, in the manner exprest in the Figure. In the middle of this, on the back side, in a convenient frame, is placed a small Cylinder, whose circumference is equal to twice the length of one of those divisions, which I find answer to an inch of ascent, or descent, of Mercury: This Cylinder I, is movable on a very small Needle, on the end of which is fixt a very light Index K L, all which are so pois'd on the Axis, or Needle, that no part is heavier then another: Then about this Cylinder is wound a small Clew of Silk, with two small steel Bullets at each end of it G H; one of these, which is somewhat the heavier, ought to be so big, as freely to move to and fro in the Pipe F; by means of which contrivance, every the least variation of the height of the Mercury will be made exceeding visible by the motion to and fro of the small Index K L.

But this is but one way of discovering the effluvia of the Earth mixt with the Air; there may be perhaps many others, witness the Hygroscope, an Instrument whereby the watery steams volatile in the Air are discerned, which the Nose it self is not able to find. This I have describ'd in the following Tract in the Description of the Beard of a wild Oat. Others there are, may be discovered both by the Nose, and by other wayes also. Thus the smoak of burning Wood is smelt, seen, and sufficiently felt by the eyes: The fumes of burning Brimstone are smelt and discovered also by the destroying the Colours of Bodies, as by the whitening of a red Rose: And who knows, but that the Industry of man, following this method, may find out wayes of improving this sense to as great a degree of perfection as it is in any Animal, and perhaps yet higher.

'Tis not improbable also, but that our taste may be very much improv'd, either by preparing our tast for the Body, as, after eating bitter things, Wine, or other Vinous liquors, are more sensibly tasted; or else by preparing